2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons

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The capacity of the Comprehensive Nuclear-Test-Ban Treaty verification regime

Working paper presented by Spain on behalf of the European Union

1. The importance and urgency of the signing and ratification, without delay and without conditions and in accordance with constitutional processes, to achieve the early entry into force of the Comprehensive Nuclear-Test-Ban Treaty is the first of the 13 practical steps agreed upon at the 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons for the systematic and progressive efforts to achieve complete disarmament.

2. A verifiable Comprehensive Nuclear-Test-Ban Treaty helps preventing both horizontal and vertical nuclear proliferation by limiting the possibility to develop new weapon designs for States already in possession of nuclear weapons, as well as creating significant obstacles on new States attempting to acquire such weapons. In this regard, the Treaty constitutes an essential pillar of the international nuclear disarmament and non-proliferation framework.

3. Since the Comprehensive Nuclear-Test-Ban Treaty was opened for signature in 1996, 182 States have signed and 151 have ratified the Treaty. Of the 44 annex 2 States required to ratify before entry into force of the Treaty, 35 have done so. All member States of the European Union, indeed all the countries on the European continent, have demonstrated their commitment to the Treaty by their ratification.

4. The European Union attaches the utmost importance to completing a credible and operational verification regime for the Comprehensive Nuclear-Test-Ban Treaty. This will provide the international community with independent and reliable means of ensuring compliance with the Treaty. In this sense, the European Union believes that the operational readiness of the verification regime can help promote its entry into force. The European Union is therefore involved both politically and financially in various ways in strengthening the verification regime and strongly supports the work of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization in this regard.

5. The global verification regime of the Comprehensive Nuclear-Test-Ban Treaty is being established by its Provisional Technical Secretariat. The verification regime

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includes the International Monitoring System (IMS), the International Data Centre and the on-site inspection regime. By the end of 2009, 83 per cent of the planned IMS station network had been installed. For the network to be fully installed and operational by the Treaty's entry into force, the full cooperation of all States hosting IMS facilities is crucial.

6. The IMS consists of several monitoring technologies; each primarily focused on detecting nuclear explosions in different media, including seismic and radioxenon detection for underground explosions, radionuclide and infrasound detection for atmospheric tests and hydroacoustic and radioxenon measurements for underwater tests. While individually contributing to the monitoring capabilities of the IMS, the different verification technologies complement each other, with the strengths of one technology benefiting the others.

7. The most likely scenario for a clandestine nuclear test made by a country seeking to acquire nuclear weapons is to perform an underground nuclear explosion. It remains important that States have confidence that the IMS is able to detect small underground nuclear explosions (around and below an explosion yield of 1 kiloton) and this has been one of the focuses in developing the detection capability.

8. Over the last decade, technologies that can assist in detection of underground nuclear tests have advanced significantly. One particular example is the technology for detection of radioactive noble gases, developed, inter alia, by France and Sweden and supported by joint actions of the European Union adopted in the framework of the Union's common foreign and security policy. This technique is now about 10 times more sensitive in comparison to the Comprehensive Nuclear-Test-Ban Treaty verification system designed in the mid-1990s. By supplementing a seismic measurement detecting and locating an underground explosion, the measurement of radioactive noble gas releases related to the same explosion provides evidence regarding the possible nuclear nature of the event.

9. The efficiency of this technology was demonstrated in October 2006 when the Democratic People's Republic of Korea conducted its first nuclear test, resulting in an approximate explosion yield of 0.7 of a kiloton. Not only was the explosion detected by the IMS seismic network, but radioactive noble gases were also detected by national technical means. The detection of radioactive noble gases confirmed the nuclear nature of the explosion. A measurement performed by an IMS radionuclide noble gas station was found to be compatible with the same conclusion.

10. The announced nuclear test by the Democratic People's Republic of Korea in May 2009 was also detected by the IMS seismic network. On that occasion, no noble gases could be detected by the surrounding IMS stations, but the detection by seismic sensors was accepted by the international community as a strong indication of a nuclear explosion. This seismic evidence alone would have provided sufficient grounds for the future Executive Council of the Comprehensive Nuclear-Test-Ban Treaty Organization to decide to launch an on-site inspection. The event in the Democratic People's Republic of Korea further served to illustrate that a robust and credible on-site inspection capability is an important component of the verification regime in order to fully clarify the character of any future suspicious event. Progress has been made here in recent years with the conduct of the integrated field exercise in 2008 and the follow-up actions now well in hand.

11. Based on recent experience and scientific development, it can be concluded that the combination of seismic and radionuclide detection, including, in particular, noble gas, together with the on-site inspection regime, which can bring to bear a number of effective inspection techniques, constitute a very powerful tool for detecting clandestine underground nuclear tests. Concerns that a fully functional Comprehensive Nuclear-Test-Ban Treaty verification regime would not detect fairly small explosion yields are therefore unjustified. In addition, the international scientific studies project, which was finalized at a three-day conference in Vienna in June 2009, showed that the verification technologies have improved substantially over the last five years.

12. However, ongoing and coordinated efforts, benefiting from continued interaction with scientific networks, help ensure that the latest verification technology developments are used in the Comprehensive Nuclear-Test-Ban Treaty verification regime in an effective manner, thereby further improving the possibility of detecting, identifying, and attributing possible nuclear tests.